Tompkins Cortland Community College

Master Course Syllabus

Course Discipline and Number: CIS 224 **Year: 2025-2026**

Course Title: Fundamentals of Security **Credit Hours: 3**

I. Course Description: This course will focus on the practical and theoretical knowledge of information security. Topics covered include network security threats, mitigation/defense techniques, virtual private networks (VPNs), firewalls, intrusion detection, and security policies in the information technology organization. The course will introduce students to the requirements and outcomes covered by the CompTia Security+ exam. Prerequisite: CIS 132. 3 Cr. (3 Lec.) Fall semesters.

II. Additional Course Information:

1. Students need a current (within the past 2 years) laptop capable of running virtual machines. Chrome Books, Surfaces, and iPads are not appropriate for this course.

III. Student Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Define and describe the information security ecosystem, including threat factors, standard bodies, technology solution providers, enterprise security professionals, industry analysts, and educational institutions.
2. Describe and demonstrate the role that network authentication and network access control play in securing networked systems.
3. Describe and illustrate core concepts related to secure network design, including layer 2 VLANs, segmentation using IP subnets, DMZ, border and internal firewall protection, and proxy services.
4. Analyze the threats and potential protections related to enterprise network infrastructure and networked applications, including mobile applications, cloud services, voice services (VoIP), and Internet of Things (IoT) using the tools and strategies used to conduct network vulnerability assessment, including penetration testing, log analysis, and security information and event management (SIEM).
5. Explain how cryptographic systems are used to provide confidentiality, availability, and integrity on enterprise networks and implement an AAA (authentication, authorization, and accounting) security environment.

IV. Tompkins Cortland Institutional Learning Outcomes; Program Learning Outcomes; SUNY General Education Outcomes

Tompkins Cortland ILOs N/A

Complete this section for “service” courses only (e.g. courses that are required of all students; courses that are not program specific but satisfy liberal arts requirements; or commonly used in multiple academic programs to meet non-program-specific requirements). Check only Institutional Learning Outcomes (ILOs) that are meaningfully developed and assessed in this course. For each ILO chosen, include the SLO to which it aligns.

Students will:

☐ Communicate effectively, in oral and written forms, taking into consideration audience and purpose.

☐ Apply principles and methods of scientific inquiry and quantitative reasoning appropriate to their discipline.

☐ Use information, critical thinking, and the creative process to solve problems and reach conclusions.

☐ Use technology appropriate to their discipline.

☐ Describe the ways in which social, economic, or environmental sustainability depends on their own and the collective contributions of a diversity of ideas and people.

Program Learning Outcomes

Complete this section for program-specific courses (e.g. those that share the same 4 letter designation as the academic program or satisfy requirements in related programs). List the academic program(s) here and note which Student Learning Outcomes align to specific Programmatic Learning Outcomes. Please see the MCS Instructions for more details.

Specify the Academic Program
Computer Information Systems A.A.S.

PLO
Apply concepts of programming, data storage, networking, and hardware/software support to creative solutions for business projects and organizational challenges.

SLO
Define and describe the information security ecosystem, including threat factors, standard bodies, technology solution providers, enterprise security professionals, industry analysts, and educational institutions.

PLO
Participate in team/group work applying concepts to real world projects based on business scenarios.

SLO
Analyze the threats and potential protections related to enterprise network infrastructure and networked applications, including mobile applications, cloud services, voice services (VoIP), and Internet of Things (IoT) using the tools and strategies used to conduct network vulnerability assessment, including penetration testing, log analysis, and security information and event management (SIEM).

PLO
Describe the concepts and principles of the information technology field and the role it plays in today's business organization.

SLO
Describe and illustrate core concepts related to secure network design, including layer 2 VLANs, segmentation using IP subnets, DMZ, border and internal firewall protection, and proxy services

PLO
Explain the methods in which the application of information technology can improve the efficiency of current business models.

SLO
Explain how cryptographic systems are used to provide confidentiality, availability and integrity on enterprise networks and implement an AAA (authentication, authorization, and accounting) security environment.

SUNY General Education Outcomes N/A

If this course **assesses** a SUNY GEN ED Outcome, check all that apply and indicate which course outcome(s) address each checked item:

☐ CRITICAL THINKING - Students will:

a. identify, analyze, and evaluate arguments as they occur in their own or others' work; and
b. develop well-reasoned arguments.

☐ INFORMATION MANAGEMENT - Students will:

a. perform the basic operations of personal computer use;
b. understand and use basic research techniques; and
c. locate, evaluate and synthesize information from a variety of sources.

☐ GENERAL EDUCATION CATEGORY - Area(s):
For courses that are approved to meet one (or more) of the ten SUNY General Education categories, indicate which category the course fulfills, and which outcome(s) are aligned with the SUNY outcomes for that category:

☐ This course does not address any of the above Tompkins Cortland ILOs, PLOs, or SUNY General Education Outcomes.

V. Essential Topics/Themes

1. Network Security Protocols
2. Threats, vulnerabilities, and attacks
3. Authentication, Authorization, and Accounting (AAA)
4. Social Engineering
5. Theory and Practice of Encryption

VI. Methods of Assessment/Evaluation

Method	**% Course Grade**
1. Quizzes: (Each Quiz will evaluate the knowledge the student acquired. **All** learning objectives will be assessed.)	20-30%
2. Exams: (Each exam will evaluate the knowledge the student acquired. **All** learning objectives will be assessed.)	20-30%
3. Lab Session: (Each lab session will evaluate the knowledge the student acquired. **All** learning objectives will be assessed.)	20-30%
4. Semester project: (This project will evaluate a student's deeper knowledge of a small topic covered in the course: **At least half** of the learning objectives will be assessed by this assignment.)	20-30%

VII. Texts – ☒ Required ☐ Recommended ☐ Used for more than one course (list courses)

1. Ciampa, Mark. *Security+ Guide to Network Security Fundamentals*. 6th ed., 2017. Cengage Learning. ISBN 978-1-337-28878-1

Editions listed are current as of date of syllabus. More recent editions may be used.

VIII. Bibliography of Supplemental Materials

1. www.nist.gov/itl/applied-cybersecurity/nice

Editions listed are current as of date of syllabus. More recent editions may be used.

IX. Other Learning Resources

Audiovisual:
https://www.professormesser.com/security-plus/sy0-601/sy0-601-video/sy0-601-comptia-security-plus-course/

Electronic:
https://www.professormesser.com/security-plus/sy0-601/sy0-601-video/sy0-601-comptia-security-plus-course/

Other: None specified

Attendance Policy: *To maintain good grades, regular attendance in class is necessary. Absence from class is considered a serious matter and absence never excuses a student from class work. It is the responsibility of all instructors to distribute reasonable attendance policies in writing during the first week of class. Students are required to comply with the attendance policy set by each of their instructors. Students are not penalized if they are unable to attend classes or participate in exams on particular days because of religious beliefs, in accordance with Chapter 161, Section 224-a of the Education Law of the State of New York. Students who plan to be absent from classroom activity for religious reasons should discuss the absence in advance with their instructors. See college catalog for more information.*

Services for Students with Disabilities: *It is the College's policy to provide, on an individual basis, appropriate academic adjustments for students with disabilities, which may affect their ability to fully participate in program or course activities or to meet course requirements. Students with disabilities should contact the Coordinator of Access and Equity Services, to discuss their particular need for academic adjustments. All course materials are available in alternate formats upon request.*

Academic Integrity: *Every student at Tompkins Cortland Community College is expected to act in an academically honest fashion in all aspects of his or her academic work: in writing papers and reports, in taking examinations, in performing laboratory experiments and reporting the results, in clinical and cooperative learning experiences, and in attending to paperwork such as registration forms.*
Any written work submitted by a student must be his or her own. If the student uses the words or ideas of someone else, he or she must cite the source by such means as a footnote. Our guiding principle is that any honest evaluation of a student's performance must be based on that student's work. Any action taken by a student that would result in misrepresentation of someone else's work or actions as the student's own — such as cheating on a test, submitting for credit a paper written by another person, or forging an advisor's signature — is intellectually dishonest and deserving of censure.
Several degree programs offer student learning opportunities (such as internships, field work, and clinical experiences) outside the standard classroom setting. As part of the learning process, students must understand and engage in conduct that adheres to principles guiding employment within the professional workplace. These behaviors include, but are not limited to, academic integrity, accountability, reliability, respect, use of appropriate language and dress, civility, professional ethics, honesty, and trustworthiness. Disciplinary action may be initiated for inappropriate conduct occurring while participating in any course-related project or event.